IN THE CLAIMS:

1.-4. (Cancelled)

5. (Currently Amended) A cooling apparatus adapted for cooling a heat-generating substrate by cold vapor refrigeration, comprising a refrigeration loop including:

a refrigerant compressor (32),

a condenser (44) for receiving refrigerant from said compressor and for outputting heat to ambient air, thereby cooling said refrigerant,

a fan (20) arranged to pass said ambient air past said condenser (44),

a throttle valve (62) for receiving cooled refrigerant from said condenser (44), and adapted to permit isenthalpic expansion of the refrigerant,

<u>an</u> evaporator (60; 100), adapted to receive refrigerant from said throttle valve (62), and thermally coupled to the heat-generating substrate (12),

a common drive motor (42) adapted to drive both said compressor (32) and said fan (20), and

a controller (54) adapted to receive a signal corresponding to refrigerant temperature, and to control said temperature by controlling a rotation speed of said fan (20).

6.-33. (Cancelled)

PLEASE ADD THE FOLLOWING NEW CLAIMS:

34. (New) The cooling apparatus of claim 5, wherein said compressor (32) and said fan (20) constitute a pair of driven units, and

said motor (42) drives one of said driven units directly and drives the other of said driven units via a magnetic coupling.

35. (New) The cooling apparatus of claim 5, wherein said drive motor (42), said fan (20) and said compressor (32) are commonly housed in a single module.

36. (New) The cooling apparatus of claim 5, wherein said refrigeration loop is a counterclockwise circular process.

37. (New) The cooling apparatus of claim 5, wherein apparatus stages are dimensioned such that, and said controller is configured such that at least some of said refrigerant undergoes phase changes between a vapor phase and a liquid phase.

38. (New) The cooling apparatus of claim 37, wherein, during operation, refrigerant, in said evaporator (60; 60') stage, is present as a boiling liquid (52a) and as a saturated vapor (52d).

39. (New) The cooling apparatus of claim 5, wherein said fan and said compressor are mounted in a common housing (40).

40. (New) The cooling apparatus of claim 39, wherein said common housing (40) is a molded element.

41. (New) The cooling apparatus of claim 40, wherein said molded element comprises a plastic material.

42. (New) The cooling apparatus of claim 5, wherein said evaporator (100) is configured as an impact plate.

43. (New) The cooling apparatus of claim 42, wherein a nozzle (114) is formed at an entry point for refrigerant (52) entering said evaporator (100).

44. (New) The cooling apparatus of claim 43, wherein said nozzle is configured as an orifice nozzle.

45. (New) The cooling apparatus of claim 43, wherein said nozzle is configured as a slit nozzle.

46. (New) The cooling apparatus of claim 43, wherein said nozzle is configured as a vena contracta to behave according to the Coanda effect.

47. (New) The cooling apparatus of claim 5, wherein said evaporator (100) has a substrate-adjacent surface and a substrate-remote surface, and said substrate-remote surface defines a concave surface (114) for contact with said refrigerant.

48. (New) The cooling apparatus of claim 47, wherein said concave surface is shaped substantially as a spherical shell.

49. (New) The cooling apparatus of claim 47, wherein said concave surface is shaped as a rotation surface of a paraboloid.

50. (New) The cooling apparatus of claim 47, wherein a plurality of mutually-spaced heat-transfer elements (116) are formed on said concave surface (114).

51. (New) The cooling apparatus of claim 50, wherein said heat-transfer elements (116) are, at least partially, needle-shaped.

52. (New) The cooling apparatus of claim 43, wherein, adjacent an entry point (114) for refrigerant entering said evaporator (100), at least one obstruction (124) is provided, to impede direct flow of refrigerant from an inlet (112) of said evaporator to an outlet (126) thereof.

53. (New) The cooling apparatus of claim 5, wherein a primary heat-transfer surface (104) of said evaporator is formed of a highly heat-conductive material.

54. (New) The cooling apparatus of claim 5, wherein said highly heat-conductive material is a metal selected from the group consisting of aluminum, aluminum alloys, copper, copper alloys, silver and silver alloys.

55. (New) The cooling apparatus of claim 5, wherein said evaporator (100) comprises an assembly formed with a refrigerant inlet (112) and a refrigerant outlet (126).

56. (New) The cooling apparatus of claim 5, wherein said evaporator (100) comprises a plurality of parts (102, 104) coupled fluid-tightly together.

57. (New) The cooling apparatus of claim 56, further comprising a radial seal (134) fluid-tightly coupling said parts to each other.

58. (New) The cooling apparatus of claim 56, further comprising a mounting flange (140) integrally formed with one of said evaporator parts.

59. (New) A method of cooling a surface of a heat-generating electronic device, using a refrigeration loop, comprising the steps of:

compressing a refrigerant in a compressor (32);

feeding said refrigerant from said compressor (32) through a condenser (44) being cooling by a fan (20);

subjecting said refrigerant from said condenser (44) to an expansion step to reduce its pressure and its temperature, until it is present as a boiling liquid and a wet vapor;

applying said boiling liquid and wet vapor to a heat-transfer surface (114) in an evaporator (100) thermally coupled to said heat-generating electronic device; and

returning refrigerant from said evaporator to said compressor (32); wherein said compressor (32) and said fan (20) rotate according to drive energy from a common motor (42), and wherein a temperature of said refrigerant is monitored and controlled (54) by controlling rotation speed of said common motor (42).

60. (New) The method of claim 59, wherein

said step of subjecting said refrigerant to expansion comprises isenthalpically expanding said refrigerant.

61. (New) The method of claim 59 wherein said step of compressing said refrigerant comprises heating said refrigerant to a temperature (t2) higher than a temperature of a medium to be used for cooling said refrigerant.

62. (New) The method of claim 61, further comprising

using ambient air to cool said refrigerant, and

said step of heating said refrigerant comprises heating said refrigerant to a temperature (t2) warmer than a temperature (t_u) of said ambient air.